

REMARKS

Claims 1-9 are pending in this application. By this Amendment, claims 1 and 7 are amended. No new matter is added.

I. Allowable Subject Matter

The indication of allowable subject matter in claim 7 is appreciated, it being allowable if rewritten in independent form to include all of the features of its base claim and any intervening claims. As claim 7 is rewritten to include the features of intervening claim 6 and independent claim 1, claim 7 is in condition for allowance.

II. Specification

Although not objected to, the Abstract is amended to reduce the number of words to less than 150.

III. Claim Rejections Under 35 U.S.C. §103

Claims 1-3, 5, 6, 8 and 9 are rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,435,780 to Flynn in view of U.S. Patent No. 5,779,399 to Kuberski and further in view of U.S. Patent No. 4,560,308 to Deller. The rejection is respectfully traversed.

None of the references, whether considered alone or in combination, disclose or suggest each and every feature recited in the claims, as originally submitted or as currently amended. For example, the combination of references fails to disclose or suggest an end mill, comprising: a cylindrical body having . . . , (b) a plurality of peripheral cutting edges each of which is provided by one of widthwise opposite edges of a corresponding one of said plurality of flutes, and (c) a plurality of end cutting edges each of which is located at said axially distal end of said cylindrical body and is contiguous to a corresponding one of said plurality of peripheral cutting edges, wherein said plurality of end cutting edges include first and second end cutting edges, said plurality of peripheral cutting edges include first and second peripheral cutting edges which are contiguous to said first and second end cutting edges,

respectively, and a first axial rake angle of said first end cutting edge is smaller than a second axial rake angle of said second end cutting edge, while a first radial rake angle of said first peripheral cutting edge is larger than a second radial rake angle of said second peripheral cutting edge, as recited in original claim 1.

In other words, the first peripheral cutting edge, contiguous to the first end cutting edge having the relatively small axially rake angle, has the relatively large radial rake angle, and the second peripheral cutting edge, contiguous to the second end cutting edge having the relatively large axial rake angle, has the relatively small radial rake angle. Thus, none of the applied references, whether considered alone or in combination disclose the original features recited in the rejected claims.

Furthermore, the combination of references fails to disclose or suggest first and second end cutting edges have a predetermined first axial rake angle and a predetermined second axial rake angle, respectively, said first and second peripheral cutting edges have a predetermined first radial rake angle and a predetermined second radial rake angle, respectively, and the predetermined first axial rake angle of said first end cutting edge is smaller than the predetermined second axial rake angle of said second end cutting edge, the predetermined first radial rake angle of said first peripheral cutting edge is larger than the predetermined second radial rake angle of said second peripheral cutting edge, as recited in amended claim 1.

It is admitted in the Office Action that Flynn fails to disclose the first axial rake angle of the first end cutting edge being smaller than the second axial rake angle of the second end cutting edge, or the first radial rake angle of the first peripheral cutting edge being larger than the second radial rake angle of the second peripheral cutting edge. In an effort to overcome the admitted deficiencies, the Office Action combines Kuberski and Deller and alleges that it would have been obvious to one of ordinary skill in the art to combine the references as

proposed in the Office Action thereby rendering the subject matter of the rejected claims obvious.

Even were the references combined, the combination still fails to disclose each and every feature recited in the rejected claims. For example, the Office Action relies on Deller for allegedly disclosing "a positive rake portion (valley) (i.e., first radial rake angle) of the first peripheral cutting edge being larger than the negative rake portion (peak) (i.e., second radial rake angle) of the second peripheral cutting edge." In Deller, each cutting edge 20 is formed with a series of crests or peaks 24 separated by valleys 26, and a relatively narrow margin 22 extends along each cutting edge 20 (col. 2, lines 48-56). The peaks and valleys define continuous cutting edges of a generally sinusoidal shape. The radial rake angle of each cutting edge 20 is a negative angle, in a section, as shown in Fig. 5, and is a positive angle, in a section, as shown in Fig. 6. Thus, the radial rake angle of the cutting edge 20 changes along its helical path. Therefore, Deller fails to disclose or suggest the first and second radial rake angles of the peripheral cutting edges have a predetermined or constant radial rake.

Furthermore, as Deller specifically recites that the most successful designs have involved the use of cutting edges having an undulating or sinusoidal configuration, Deller actually teaches away from a cutting edge having a predetermined or constant rake (col. 1, lines 29-31).

Therefore, there is no motivation or suggestion to incorporate the teachings of Deller with Flynn and Kuberski. Furthermore, since neither Flynn nor Kuberski is alleged to disclose, nor does disclose such a feature, withdrawal of the rejection of claims 1-3, 5, 6, 8 and 9 under 35 U.S.C. §103(a) is respectfully requested.

Claim 4 is rejected under 35 U.S.C. §103(a) as unpatentable over Flynn in view of Kuberski and Deller and further in view of U.S. Patent No. 5,094,573 to Hougen. The rejection is respectfully traversed.

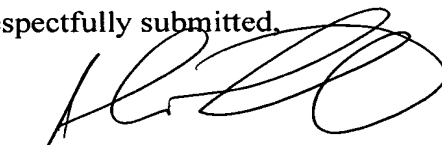
Claim 4 is allowable for its dependency on independent claim 1 for the reasons discussed above, as well as for the additional features recited therein. Furthermore, since Hougen fails to disclose or suggest any of the deficiencies of Flynn, Kuberski or Deller, withdrawal of the rejection of claim 4 under 35 U.S.C. §103(a) is respectfully requested.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-9 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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